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Description

Rotation rate sensor having a vibration gyro

5 The invention relates to a rotation rate sensor having a vibration gyro with circuits which are used for operation of the vibration gyro and for emission of a rotation rate signal and which access variable data, having a non-volatile memory which can be written to and in which the data is stored, and  
10 having means for reading the data from the non-volatile memory after switching on the rotation rate sensor, with the data being subdivided into groups on the basis of its use, and measures for data protection being taken for in each case one group.

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By way of example, EP 0 461 761 B1 discloses rotation rate sensors in which a vibration gyro is excited on two axes which are aligned radially with respect to a major axis, for which purpose a primary and a secondary control loop having  
20 appropriate transducers are provided on the vibration gyro. These control loops may include various analog and digital circuits, with the analog circuits and the vibration gyro having tolerances, so that adjustment is necessary, at least during the production of the rotation rate sensor. The  
25 individual circuits then access the stored data during subsequent operation.

Furthermore, EP 1 189 025 A2 and DE 42 42 557 A1 have disclosed data such as this being stored in an EEPROM. For safety  
30 reasons, the data is stored in a duplicated (redundant) form in EP 1 189 025 A2, so that the correctness of the data that is read can be checked by comparison. In

addition, only one data storage process is provided during the production of the rotation rate sensor.

5 In the case of a rotation rate sensor which has been disclosed in DE 43 40 791 A1, a non-volatile memory is provided in an associated electronic controller and has written to it table values which change as the "learning success" of the controller progresses. There is therefore fundamentally a risk that, in poor circumstances, incorrect data may also be written to the  
10 volatile memory.

Furthermore, it may be necessary to match characteristics of the rotation rate sensor to the respectively intended purpose, for example by presetting parameter sets for filters.

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The rotation rate sensor according to the invention is characterized in that the memory is arranged such that the data for in each case one group can be written and read independently of the data of the other groups, and in that a  
20 checksum is formed over the data for in each case one group, is stored in the non-volatile memory, and is used for checking during reading. The non-volatile memory is preferably an EEPROM or a flash EEPROM.

25 The invention makes it possible to write the data in each of the individual groups to the non-volatile memory, and to edit it, in a mutually independent manner, at different times. By way of example, the adjustment data can thus be stored in the non-volatile memory towards the end of the production process,  
30 while parameter sets which relate to the use of the rotation rate sensor, for example the vehicle type in which

the rotation rate sensor is intended to be installed, are stored later, by the user.

5 All of the data which in any way governs the operation of the rotation rate sensor can be stored in the non-volatile memory. In particular, provision is made in the case of the rotation rate sensor according to the invention for the adjustment data and/or parameter sets for filters and/or value limits for self-testing of the rotation rate sensor to be stored.

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One development of the rotation rate sensor according to the invention comprises a software emulation program also being stored in the non-volatile memory.

15 The invention allows numerous embodiments. One of these will be described in the following text and is illustrated schematically in a number of figures in the drawing, in which: